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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/039,618	01/04/2002	Steven Teig	SPLX.P0049	2525

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EXAMINER

LIN, SUN J

ART UNIT PAPER NUMBER

2825

DATE MAILED: 10/09/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/039,618

Applicant(s)

TEIG ET AL.

Examiner

Sun J Lin

Art Unit

2825

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 9-14 is/are allowed.
- 6) ☒ Claim(s) 1,2,4 and 15-17 is/are rejected.
- 7) ☒ Claim(s) 3,5-8 and 18-21 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 04/17/2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. This office action is in response to application 10/039,618 filed on 01/04/2002. Claims 1 – 21 remain pending in the application.

Claim Objections

2. Claims are objected to because of the following informalities:
- Claims 3, line 2, in front of "relationship" insert **—particular—**.
- Claims 9, line 1, change "layout," to **—layout, the method comprising:—**.
- Claims 9, line 7, in front of "set" insert **—first—**.
- Claims 9, line 8, change "sub-region" to **—sub-regions—**.
- Claims 11, line 2, change "sub-region" to **—sub-regions—**.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

- vs 1, 2, 4 and 15-17 are
4. Claims ~~1-15~~ are rejected under 35 U.S.C. 102(b) as being unpatentable over U.S. Patent No. 5, 798,936 to Cheng.

5. As to Claim 1, Cheng shows and teach the following subject matters:
- Identifying a set of routes for a net having a set of pins in a region of a design layout – [Fig. 2]; Notice that the net has three (3) pins on three edges of the region;
 - Splitting (i.e., Partitioning) the region into a plurality of sub-regions – [Step 16 in Fig. 1; Fig. 4; col. 4, line 24 – 38];
 - Identifying a first set of sub-regions containing the net's pins; Notice that as indicated in Fig. 1, the region is continually partitioned into a plurality of sub-

regions until reaching a condition that each sub-region is sufficiently large to accommodate a pin; Three sub-regions that contain the three pins are constituted the first set of sub-regions; other sub-regions that are not included in the first set of sub-regions in the layout may be called a second set of sub-regions;

- Each pin has a small portion of interconnecting route contained in the same sub-region of the first set of sub-regions; the orientation of interconnecting route indicates the direction in which the interconnecting route is being connected to a second route in the second set of sub-regions – [Fig. 3]; Therefore, based on structural information of first set of sub-regions, a first route (i.e., a small portion of interconnecting route from a pin) that traverses a second set of sub-regions is identified; Notice that the first and second set of sub-regions are adjacent to each other, and have a particular Steiner Tree relationship as indicated in Fig. 2;
- Based on the particular Steiner Tree relationship, identifying a second route from the first route. In order to make a connection to a pin, the second route traverses the first set of sub-regions.

For reference purposes, the explanations given above in response to Claim 1 are called **[Response A]** hereinafter.

6. As to Claim 2, Cheng shows in Fig.2 that a Steiner Tree identifies the particular relationship between the first and second sets of sub-regions.

For reference purposes, the explanations given above in response to Claim 2 are called **[Response B]** hereinafter.

7. As to Claim 4, Cheng teaches that each chip design floorplan area (i.e., design region) is partitioned into uniform two-dimensional arrays (i.e., sets) of regions (i.e., sub-regions). Therefore, the first and second sets of sub-regions have a symmetrical relationship.

For reference purposes, the explanations given above in response to Claim 4 are called **[Response C]** hereinafter.

8. As to Claim 15, reasons are included in **[Response A]** given above.
9. As to Claim 16, reasons are included in **[Response B]** given above.
10. As to Claim 17 reasons are included in **[Response C]** given above.

Allowable Subject Matter

11. Claims 9 – 14 are allowed. Claims 3, 5 – 8 and 18 – 21 are objected to as being dependent upon a rejected base claim, but they would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Those claims are allowed is because that the prior art does not teach or suggest the following subject matters:

- Identifying the particular relationship comprise retrieving an indicia that specifies the particular relationship from a storage structure as recited in **Claim 3**;
- Identifying the second route comprises transforming the first route into the second route based on the symmetrical relationship as recited in **Claims 5/6,7,8 and Claims 18/19, 20, 21**;
- A method of identifying routes for nets in a region of a design layout, the method comprising: for each particular net, retrieving first set of routes for the identified set from a storage structure, wherein each route in the retrieved first set of routes traverses a base set of sub-regions that has a particular relationship to the identified set of sub-regions as recited in independent **Claim 9**.

Conclusion

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sun J. Lin whose telephone number is (703) 308-4916. The examiner can normally be reached on Monday-Friday (9:00AM-6:00PM).


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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Smith can be reached on (703) 308-1323. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-1782.

Sun James Lin
Art Unit 2825
September 24, 2003


VUTHE SIEK
PRIMARY EXAMINER